

An easy method of identifying the species of the genus *Cnephasia* = *Sciaphila* (Tortricidæ). (*With plate.*)

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The *Sciaphilas*, as they are generally termed, have long presented such insurmountable difficulties to collectors that they have practically given up the genus in despair, and have placed such specimens as they have received from correspondents in their cabinets under the name sent rather than attempt to settle their identity for themselves. That this state of affairs is general is evident from the mixed series forwarded for examination from many collections. Here the study of the genitalia steps in, and separating the specimens with indisputable accuracy removes the problem from the sphere of individual opinion.

Entomologists, when in future setting their captures, would do well to open the valvæ as far as possible whilst the insects are still on the boards, and thus make subsequent examination a simple matter.

In order first of all to discover how many British species the group contained it was necessary to make microscopical mounts of many named specimens and unnamed varieties. This having been done it was not a very difficult matter to determine to which species each form belonged. Having thus obtained reliable examples of all the British species, the question as to whether a simpler and less destructive method could not be devised for determining the species by means of the genitalia, since collectors not unnaturally object to the breaking up of each specimen, in order to discover to what species it belongs. With this end in view a thorough examination was made of dried but unmounted examples of all the species, using the already mounted examples as a guide. The method of working is as follows:—

Run a knife across a piece of flat cork, and then pencil the slit so that it may be readily found. Next, by pushing the head of the pin (holding the point by the forceps) into the slit, the insect is held securely with the ventral surface of the abdomen in position for examination under the microscope. Having brought the genitalia into focus and arranged a bull's eye condenser so as to illuminate brilliantly the part, remove by means of a small sable brush (W. and N., No. 00) sufficient scales to expose the junction of the valvæ. At first it will probably be found necessary to lay bare both valvæ, but when the eye gets accustomed to the appearance the merest touch is sufficient to determine the species. With the aid of the drawings, herewith given, of the genitalia as thus seen with the scales removed, no one should have the smallest difficulty in naming his male captures. Once having located the males, but little further trouble should be experienced in mating the females.

The different species are subject to great variation in wing markings, but perhaps the most difficult to determine superficially are those which tend towards albinism, the markings almost entirely disappearing, and we are left with a chalky white specimen and nothing to guide us as to its species except the shape of the wing, which is so variable as to be absolutely useless. The examination of the genitalia, however, at once determines the question.

Before describing the distinguishing features of the genitalia in each case, attention must be drawn to certain difficulties in the nomenclature.

Following Meyrick's *Tortricidae*, published by Wytzman, which I have found of the utmost value in nomenclature, we read, p. 44.

Genus *Cnephasia*, Curtis.

- CNEPHASIA, Curt., 1826, type *pascuana*, Hüb.
 ABLABIA, Hüb., 1816, type *osseana*, Scopoli.
 NEPHODESME, Hüb., 1816, type *penziana*, Thunb.
 SCIAPHILA, Treit., 1829, type *wahlbomiana*, L.
 ARGYROPTERA, Dup., 1834, type *argentana*, Clerk.

The whole group falls naturally in accordance with the genitalia into two sections:—

- (a) The CNEPHASIA (Curt., 1826) group type *pascuana*.
 (b) The NEPHODESME (Hüb., 1816) group type *penziana*.

In this division (a) would contain of the British species *Cnephasia octomaculana*, *C. conspersana*, *C. chrysantheana*, *C. pascuana*, *C. virgaureana*, *C. genitalana*, *C. subjectana*, and *Sphaleroptera ictericana*. (b) would contain *Nepholesme penziana*, *N. colquhouniana*, *N. sinuana*, *N. nubilana*, with *Ablabia osseana*, *Argyroptera argentana*, and *Tortricodes hyemana*.

The generic name SCIAPHILA, Treit., 1829, of which *wahlbomiana* is the type, must fall, not only on the ground of priority, but also because the type *wahlbomiana* does not, as we shall presently show, represent any particular species.

What then is *wahlbomiana*? As early as 1873, in the *Entomologist's Annual*, p. 50, O. Hofmann quotes Heinemann's opinion that *incertana* (*subjectana*) *wahlbomiana*, *communiana*, *alticolana*, *minorana*, and *virgaureana*, are simply varieties of the Linnean *wahlbomiana*. "The *wahlbomiana* group as it can scarcely be rightly described as composed of one species." Heinemann. Vol. ii., p. 58. *Ent. Ann.*, p. 68.

Hofmann, *Entomologist's Annual*, 1873, p. 53, writes:—" *Wahlbomiana*, *communiana*, *alticolana*, *virgaureana*, *derivana*, and *paraliana*, seem all to be only different forms of a single species, which shows an extraordinary tendency to vary even in the larval state, as will be pointed out further on."

Mr. Meyrick (*in litt.* 18 : 12 : 24) writes:—" *Wahlbomiana*. In my opinion this name is not applicable to any species, having probably been originally a confused jumble of several. But its use on the continent is certainly for the species we call (in my opinion correctly) *virgaureana*, though not infrequently authors still mix up other species with it. I think you may neglect it."

Kennel, *Zoologia Palvarktischen Tortriciden*, Stuttgart, 1908, figures the genitalia of *wahlbomiana*. The figure is, however, not good enough to decide whether it represents *chrysantheana*, *pascuana*, *octomaculana*, or *communiana*, but there is sufficient detail to say that it is certainly not *virgaureana*. Kennel includes under CNEPHASIA, *wahlbomiana*, *alticolana*, *virgaureana*, *derivana* = *paraliana*, *chrysantheana*, Dup. = *chrysantheana*, H.-S. = *assinana*, Hw. (Wood, fig. 1,000) = *alternana*, Wilk., *pasivana* (rect. *pascuana*), Hb. = *pasivana*, H.-S. = *obsoletana*, Stph. (Wood, fig. 1,003), *logiana* (Wood, fig. 1,002) = *interjectana* (Wood, fig. 1,001).

This list includes all given by Heinemann except *incertana* and its var. *minorana*, which he evidently rejects because of the retractile

ovipositor of the female, and *communana*, which Kennel and Hofmann evidently consider a good species.

Mr. A. Thurnall, in a letter to Mr. Mansbridge, 26 : 1 : 15, writes:— "*Wahlbomiana* I never could make out. It appears to me that this name has been used (in this country at all events) as a sort of entomological scrap-heap on which to pitch all dubious specimens of this difficult genus! The late Mr. Ragonot told me once (*in litt.*) that the species was a good one and not unlike *subjectana*."

Bankes, *Ent. Mo. Mag.*, 1906, p. 84, writes of "the various forms included by Rebel under the all embracing term *wahlbomiana*."

From the above it is evident that *wahlbomiana* is a hotch-potch, a group of species to which any dubious specimen can be relegated. It must be left to those versed in the law of priority to state a case as to what should be done with the name!

Another difficult point is: What is *abrasana*? It has not been possible to obtain specimens for examination, and the only definite particulars to hand are contained in an article by Prof. O. Hofmann, *Entomologist's Annual*, 1873, p. 50, where he describes the female as possessing a long ovipositor. As this long ovipositor only occurs among our British species in *subjectana*, it follows that *abrasana* could only be confounded with this last named species. Mr. Meyrick writes, "my specimens (British) are only ♀. I see no reason why they should not be unicolorous females of *pascuana*, and this is probable. Kennel does not figure the male genitalia, and therefore probably had also only females, though he does not explicitly say so."

Mr. Thurnall writes, "With regard to *abrasana* I never saw but two, and these seemed to me simply small melanic specimens of *chrysantheana* such as I have bred (with the type) and captured."

Barrett, *Lep. Brit. Isles*, vol. x., p. 271, places it next to *subjectana* and describes it, "Forewings short and broad, uniform dark olive grey." His figure is a unicolorous olive-brown. He says, "A very rare species in this country, and one of which next to nothing is known."

All other collectors appealed to report that they do not possess specimens, and the probable conclusion is that in Britain no such species exists.

In conclusion, a few remarks on the distinguishing features on the genitalia as figured may be of use.

In section (a), the CNEPHASIA group, the important feature to note is the position of the blackish extremity of the sacculus. In this group the four species, *chrysantheana*, *octomaculana*, *communana*, and *pascuana*, are the only ones which will present any difficulty.

In *chrysantheana* the extremity of the sacculus is seen on the edge of the margin of the valva, *well towards the tip*. If it appears *towards the centre*, the specimen must be either *communana*, *pascuana*, or *octomaculana*.

In *communana* the edge of the sacculus is very straight, the point turning sharply inwards at the middle. The long narrow wings are a useful guide, and if in addition it be known that the insect was captured at the end of May or in early June, this fact provides further confirmation.

In *pascuana* the margin of the sacculus is more curved and the extremity emerges at the middle, with rather more of its length free from the valva.

In *octomaculana* the point appears slightly beyond the middle, but not so near the tip as in *chrysantheana*. This species possesses, in addition to the albino form, var. *albo-octomaculana*, a slatey-grey form, which might be confused with *chrysantheana*, but if the position of the end of the sacculus be kept in mind no difficulty should be experienced. It should also be noted that there is a northern form of *conspersana*, which bears a striking resemblance to *octomaculana*, but of course the resemblance does not extend to the genitalia.

Virgaureana presents but little difficulty, the small point of the sacculus at the extreme end of the squared valva determining it at once. When the points are very long and cross each other, the collector recognises the new species *genitalana*.

In *conspersana* and *subjectana* the point of the sacculus is not as a rule visible, but there is not much chance of confusing these two species with each other.

In *ictericana*, which might well be confused with the albino forms of other species, the point of the sacculus is large, black, and very low down towards the base of the valva.

In section (b), the NEPHODESME group, no difficulty will be found in separating by the wing markings *argentana*, *osseana*, and *hyemana*.

In *penziana* the sacculus is slightly more robust and rather more curved than in *colquhounana*, but the difference is very small.

In *sinuana*, which is really the only species over which trouble may arise, the long transparent amber coloured sacculus at once separates the male, and the flattened appearance of the floricornis ovipositor the female, from the species in section (a).

In *nubilana* the twice angled margin of the sacculus is at once decisive.

It will thus be seen that any two species liable to be mixed up in the wing markings can be separated readily by the genitalia, whereas in those species where the genitalia in unmounted examples appear to run rather close, the wing parts lend assistance to their determination.

[If any difficulty is experienced Mr. Pierce will be pleased to examine and report on any series of specimens that may be submitted to him at "The Elms, Dingle, Liverpool."—H.J.T.]

A Contribution to the Life-history of *Pyrgus proto*.

By. W. G. SHELDON, F.E.S.

On May 15th, last year, I found the larvæ of a Hesperid commonly on a species of *Phlomis*, since identified as *P. herba-renti*, at Novorossisk, and later in the month the same larvæ were locally abundant at Sarepta, on this plant.

At the time I presumed they were either *Hesperia cribrellum*, or *H. tessellum*, both of which species are known to feed upon *Phlomis*, but, as they did not pupate until after these were on the wing, I could only conclude that they would produce some other species.

The larvæ attained their full growth at the end of May, and then formed a chamber in which to pupate, either by spinning together the edges of a leaf of their food-plant, or by forming with silk a pocket in the gauze of the sleeve in which they were kept. In this chamber they remained unchanged for a period of several weeks, for the majority of them had certainly not pupated on my return to England on July 5th.